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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/056,483	01/28/2002	Zeev Smilansky	2786-0203P	5637

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EXAMINER

HUNG, YUBIN

ART UNIT PAPER NUMBER

2625

DATE MAILED: 11/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

✓
10/056,483

Applicant(s)

SMILANSKY, ZEEV

Examiner

Yubin Hung

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment/Arguments

1. This action is in response to amendment filed August 31, 2005, which has been entered.
2. Claims 1-22 are still pending.
3. In view of Applicant's amendment, the objections to the oath/declaration, the specification and the drawings have been withdrawn.
4. In view of Applicant's amendment, the 35 USC § 102 and § 103 rejections of claims 1-22 have been withdrawn. However, they are rejected in view of the new ground(s) of rejection. See below.
5. Applicant's arguments filed 08/31/05 have been fully considered but they are not persuasive; see below.
6. **In remarks Applicant argued in substance:**
 - 6.1 (RE claim 1) *that in the specification one of the examples has $T(x_i)$ not equal to x_i (P. 12, last paragraph, line 1 through P. 13, first paragraph)*

However, in the office action mailed 03/17/05, this fact is not relied upon in the rejection of claim 1. Instead, the rejection simply points out that in Brown the relationship between $T(x_i)$ and x_i is $T(x_i) = x_i$. Note further that " $T(x_i)$ not equal to x_i " is *not* a claim limitation. In any event, this argument is moot due to the new rejection of claim 1 (necessitated by the amendment).

6.2 (RE claim 5) *that Rosenfeld fails to map data from one array to those of another array (P. 14, last paragraph)*

However, in P. 47, 3rd paragraph – P. 48, 1st paragraph Rosenfeld does suggest a method of correlating two arrays without superimposing them. This is clear especially from line 5 of page 48, where the identification of m matched pairs (i.e., mapping m data from one array to m data from another) is indicated. In addition, as pointed out in the previous office action, Sect. 9.2 on page 23 of Rosenfeld further discusses general scene registration that is not by superimposition.

DETAILED ACTION

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-4, 9-13 and 17-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al. (US 6,826,363).

9. Regarding claim 1, and similarly claims 9, 13 and 17-22, Brown discloses

- associating to each of a plurality of pixels x_i in the first array a pixel $T(x_i)$ in the second array
- applying a linear regression analysis to the ordered pairs of numbers $(x_i, T(x_i))$ so as to produce a slope, wherein "linear regression" includes using a filtering operation in which points are deleted from the set of points prior to determining the linear fit

[Col. 2, line 29-Col. 3, line 42, especially Col. 3, lines 15-42. Note that the 1st array of signals is $\{r_m\}$ and the 2nd array is $\{g_m\}$, both are measured fluorescent intensities and that R (in Equation 6) is the slope to be determined by the least squares fit (a form of linear regression). Further note that if x_i designates the array element (a pixel) of the 1st array at which r_m is measured, then $T(x_i)$ is the array element of the 2nd array at which g_m is measured. Note further that different filtering operations are disclosed in Col.3, lines 34-42. In addition, Col. 1, lines 51-55 discloses the need to perform filtering]

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10. Regarding claim 2, and similarly claim 10, Brown further discloses

- wherein the first and second signal arrays are superimposed and $T(x_i) = x_i$
[Col. 2, lines 15-Col. 3, line 42. Note that since the signals (r_m and g_m) are measured at the same array element, the arrays are in effect superimposed and therefore $T(x_i) = x_i$]

11. Regarding claims 3 and 4, and similarly claims 11 and 12, Brown further discloses

- (claim 3) the first and second signal arrays are obtained by incubating a DNA chip in the presence of first and second probe species, the first probe species producing a signal that is distinguishable from a signal produced by the second probe species
(claim 4) the first and second signal arrays are obtained by staining a spot in separation pattern with first and second labels, the first label producing a signal that is distinguishable from a signal produced by the second label

[Col. 2, lines 10-40. Note that the staining is by using either red or green fluorescence, with red and green being the two labels]

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 5-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brown (US 6,826,363) as applied to claims 1-4, 9-13 and 17-22 above, and further in view of Rosenfeld et al. (Digital Picture Processing, 2nd ed., 1982, pp. 23 & 46-48).

14. Regarding claim 5, and similarly claim 14, Brown discloses all limitations of its parent, claim 1.

Brown does not expressly disclose

- the first and second arrays are not superimposed

However, Rosenfeld suggests a method of correlating two arrays without superimposing them. [P. 47, 3rd paragraph – P. 48, 1st paragraph. Note that the matching techniques discussed register corresponding pixels and define coordinate transformations from one pattern to another. Sect. 9.2 on page 23 discusses general scene registration.]

Rosenfeld is combinable with Brown because they both have aspects that are from the field of endeavor of pattern matching.

At the time of the invention, it would have been obvious to one of ordinary skill in the field to modify Brown with the teaching of Rosenfeld by not superimposing the arrays being analyzed as well as to register the patterns to be matched. The motivation would have been because distortion can be expected and therefore the patterns to be matched cannot be expected to be identical, as is well known in the art at the time of the invention (for example, as evidenced in Col. 2, line 60-Col. 3, line 16 of US 6,362,832, issued to Stephen et al.).

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Therefore, it would have been obvious to combine Rosenfeld with Brown to obtain the invention as specified in claim 5.

15. Regarding claim 6, and similarly claim 15, Brown further discloses

- the first and second signal arrays are spots in a first and second separation patterns, respectively
[Per the analysis of claim 4. See also Col. 3, lines 29-42]

16. Regarding claim 7, and similarly claim 16, Rosenfeld further teaches/suggests

- the first and second separation patterns are in register, and for each pixel x_i in the first spot, $T(x_i)$ is the spot in the second separation pattern in register with x_i
[Per the analysis of claim 5]

17. Regarding claim 8, since the methods of claims 1-7 are for linear regression on image signals, they are applicable to images of signals acquired from differential gene expression and differential protein expression.

Contact Information

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

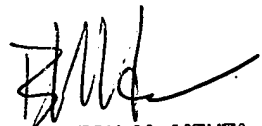
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
November 17, 2005



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